

U.S. Patent Application Serial No. 10/564,633
Amendment filed August 26, 2008
Reply to OA dated March 27, 2008

REMARKS

Claims 1-11 are pending in this application. Claims 12 and 13 are newly added herein. Upon entry of this amendment, claims 1-13 will be pending. Entry of this amendment and reconsideration of the rejections are respectfully requested.

No new matter has been introduced by this Amendment. Support for new claims 12 and 13 may be found in paragraph [0036] of the specification, as published.

Claim 1 is objected to because of informalities. (Office action paragraph no. 1)

The Examiner states that "the pigment" in claim 1, lines 5-6, lacks antecedent basis.

The objection to claim 1 is respectfully traversed, and reconsideration is requested. Claim 1, line 2, recites "a pigment layer" (using the indefinite article "a"), and the Examiner refers to the phrase "the pigment contained in the pigment layer" in lines 5-6, as lacking antecedent. However, Applicant submits that the initial recitation of "a pigment layer" will be generally understood by one of skill in the art to be a layer **containing pigment**, and therefore there is **inherently** a pigment contained in this layer. Since the pigment is an inherent component of the already recited "pigment layer," the subsequent use of the definite article "the" is appropriate (see MPEP 2173.05(e)).

Claims 1, 5, 10 and 11 are rejected under 35 U.S.C. §102(b) as being anticipated by Mukoyoshi et al. (US 6,187,430 B1). (Office action paragraph no. 3)

The rejection of claims 1, 5, 10 and 11 is respectfully traversed, and reconsideration is requested.

The Examiner refers to the disclosure in Mukoyoshi et al. at column 5, line 12, of an undercoat layer formed on the surface of a substrate sheet, with a cast-coated layer formed on the undercoat. The undercoat layer in Mukoyoshi is disclosed at column 5, line 16, to comprise a pigment and a binder. The Examiner considers the undercoat to correspond to the pigment layer in claim 1, and the cast-coated layer to correspond to the ink-receiving layer.

The Examiner cites column 5, line 34, as disclosing that the pigment comprises silica particles having an average secondary particle size of 2-8 μm , which would meet the limitation of average secondary particle diameter of not less than 1 μm and not more than 5 μm , in claim 1.

However, first of all, the Examiner does **not** point out a disclosure in the reference of the limitation: "50% by volume or more of the total volume of the pigment has a secondary particle diameter of not less than 1.2 μm and not more than 15 μm ." The reference does **not** appear to disclose or explicitly suggest this limitation.

The Examiner has presented no basis in fact and/or technical reasoning for an assumption that this limitation would be inherent in Mukoyoshi's disclosure, and Applicant submits that this limitation is not inherent in the reference. The volumetric percent value is proportionate to the cube of the particle diameter. Thus, if even a small amount of particles having a diameter of more than 15 μm exist, the particles in Mukoyoshi would not fall within the presently claimed range.

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Secondly, the Examiner cites column 14, line 42, which discloses a gelatinizing agent that may be applied in one of four ways (column 14, lines 25-40), with the fourth way being contained in the coating liquid. This gelatinizing agent may be boric acid, formic acid, salts of these, aldehyde compounds and epoxy compounds. Applicant submits that this does **not** represent an anticipating disclosure of boric acid, since boric acid is only one of many possibilities. Note that none of the Examples in the reference appears to use boric acid as the gelatinizing agent.

Thirdly, with regard to the limitation on dry coating amounts, the Examiner cites column 7, line 30, which discloses that the undercoat is coated at 2-100 g/m², and column 15, line 1, which discloses that the cast-coated layer is coated at 1 to 30 g/m². However, these lines do **not** represent a specific disclosure of the limitation of 20% to 120% of first ink-receiving layer to pigment layer, which is a **ratio** limitation.

To summarize, Mukoyoshi does **not** anticipate claim 1 on three grounds: 1) Mukoyoshi does not disclose the "50% by volume or more ..." limitation on the pigment particles; 2) boric acid is one of several possible gelatinizing agents; and 3) Mukoyoshi does not disclose the ratio limitation of the last lines of claim 1.

Claim 2 is rejected under 35 U.S.C. §103(a) as being unpatentable over Mukoyoshi et al. (US 6,187,430 B1), as applied to claim 1 above, and further in view of Totani et al. (US 2001/0009712 A1). (Office action paragraph no. 8)

The rejection of claim 2 is respectfully traversed, and reconsideration is requested.

In traversing the rejection, Applicant argues first, as above, that base claim 1 is not anticipated by the disclosure of Mukoyoshi.

Most notably, as discussed above, Mukoyoshi does not disclose the limitation of claim 1 that: "50% by volume or more of the total volume of the pigment has a secondary particle diameter of not less than 1.2 μm and not more than 15 μm ." Applicant has argued that there is no basis for the assumption that this limitation would be inherent in the Mukoyoshi reference. The Examiner has also pointed out no suggestion or motivation for this limitation in the reference.

Moreover, this limitation is associated with results that are unexpected over the cited reference. As described in paragraph [0034] of the present specification, the pigment prevents cracking on the surface of the ink-receiving layer when the particles have the specific average secondary diameter and the specific distribution thereof. This effect is clearly unexpected over the cited references.

Moreover, in the rejection, the Examiner cites Totani et al. for teaching an ink jet recording sheet comprising an undercoat layer containing a pigment having oil absorption of 250 ml/100g.

Applicant notes that Totani, claim 4, etc., discloses that the pigment for the undercoat layer has an oil absorption of 250 ml/100 g or less. However, in paragraph [0053], the statement is made that the inorganic pigment usually has a major axis of particles preferably in the range of 0.5 μm to 50.0 μm . This range does not fall under the presently claimed range, i.e., 50% by volume or more

of the total volume of the pigment has a secondary particle diameter of not less than 1.2 μm and not more than 15 μm . Totani therefore does not provide this limitation of claim 1.

Moreover, Applicant submits that Totani discloses a biaxially oriented film as a substrate (paragraph [0035]), while Mukoyoshi generally discloses use of paper sheets (column 4, line 21). Given Totani's specificity for biaxially oriented films, it is not clear that there is a motivation for combining Totani and Mukoyoshi.

In addition, in the present invention, the first ink-receiving layer contains inorganic ultrafine particles, a hydrophilic binder and boric acid or a borate. Thus, the hydrophilic binder is mixed with boric acid or a borate in the preparation of the coating solution. However, Mukoyoshi, column 14, lines 25-40, states that a gelatinizing agent is supplied in four possible ways, and in all cases, the water-soluble binder does not coexist so as to promote the non-mobility of the coating liquid. As can be seen from comparison of Example 8 with Comparative Example 5 of the present application, boric acid or a borate prevents crack from occurring on the surface of the coating layer and enhances ink absorbability. This result, which is associated with the presence of the boric acid or borate in the present invention, is clearly unexpected over the cited references.

In particular, Totani relates to an ink jet recording sheet comprising a film support, not a paper support. The results associated with the present invention, that is, avoiding the problem of cracking of the surface of the ink-receiving layer on a paper support, are therefore unexpected over this reference.

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Applicant therefore submits that claim 2 is not obvious over Mukoyoshi et al. and Totani et al., taken separately or in combination.

Claims 4 and 9 are rejected under 35 U.S.C. §103(a) as being unpatentable over Mukoyoshi et al. (US 6,187,430 B1), as applied to claim 1 above, and further in view of Quintens et al. (US 2002/0094421 A1). (Office action paragraph no. 10)

The rejection of claims 4 and 9 is respectfully traversed, and reconsideration is requested.

The Examiner states that Mukoyoshi does not teach that the ink receiving layer comprises alumina hydrate, and cites Quintens et al. as disclosing an ink receiving layer containing a pigment that is boehmite (citing paragraph [0072]).

In addition to Applicant's above arguments regarding the lack of disclosure in Mukoyoshi of the limitations of base claim 1, Applicant submits that paragraph [0072] of Quintens discloses a large number of possible pigments, some of which are inorganic, one of these being boehmite. However, Applicant submits that this is clearly stated to be a **pigment**, and paragraph [0073] discloses that the preferred pigment is silica having average particle size from 1 to 15 μm . Clearly, these are analogous to Mukoyoshi's **pigment** particles, and **not** to Mukoyoshi's "specific fine particles" of the cast-coated layer.

Therefore: 1) there is no motivation to replace Mukoyoshi's specific fine particles (which are taken as analogous to inorganic fine particles of the ink-receiving layer) with Quinten's boehmite;

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and 2) Quintens' boehmite is not in the form of ultrafine particles, and even if such a substitution were made, would clearly not meet the "ultrafine" limitation of claim 1.

Furthermore, Quintens uses PET film as the support, not paper. Therefore, the results associated with the present invention, of preventing cracking from occurring on the surface of a support, can be seen to be unexpected over Quintens, as well.

Applicant therefore submits that claims 4 and 9 are not obvious over Mukoyoshi et al. and Quintens et al., taken separately or in combination.

Claims 1-4, 6, 9-11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Sismondi et al. (US 6,387,473 B1) in view of Totani et al. (US 2001/0009712 A1), Tsuchiya et al. (US 6,495,242 B1) and Quintens et al. (US 2002/0094421 A1). (Office action paragraph no. 13)

The rejection of claims 1-4, 6, and 9-11 is respectfully traversed, and reconsideration is requested.

The Examiner cites Sismondi for teaching an ink jet receiving sheet comprising a support and at least two ink receiving layers, and a subbing layer (column 5, line 49). The Examiner apparently considers the subbing layer generally to correspond to the pigment layer in claim 1. In paragraph no. 16 of the Office action, the Examiner cites Totani for the disclosure of an undercoat layer containing a pigment having oil absorption of 250 ml/100g, and states that "it would have been obvious ... to combine the undercoat layer of Totani with the invention of Sismondi ..." Applicant notes that the

rejection does not clearly state how this combination is being made; Applicant infers that the undercoat layer of Totani is being substituted for the subbing layer of Sismondi.

The Examiner states that the ink receiving layer of Sismondi comprises a binder, inorganic filler and hardener, but that Sismondi does not teach boric acid as the hardener. Tsuchiya is cited for disclosing an ink jet recording sheet comprising an ink absorbable layer/void layer, where the void layer comprises boric acid as a hardener. The Examiner states that it would have been obvious to "combine the boric acid of Tsuchiya with the invention of Sismondi." Again, Applicant submits that it is not completely clear how this combination is being made.

In traversing the rejection, Applicant submits that there is no motivation to combine the references as the Examiner has suggested.

First of all, Sismondi's "subbing or primer layer" is being taken as the pigment layer in claim 1. However, Sismondi's subbing or primer layer is "to **improve the adhesion** between the film support and the ink receiving layer" (column 5, line 49) and includes photographic subbing layers such as polymers of vinylidene chloride. The pigment in Sismondi is **in the resin-covered paper** (column 5, line 13), which serves as the support (column 5, line 25). There is no suggestion for pigment in the subbing layer of Sismondi.

Moreover, Totani's undercoat layer is a pigment layer, while the purpose of Sismondi's subbing layer is clearly "to improve the **adhesion**." There is no motivation for the Examiner's

proposed substitution of Totani's undercoat layer for Sismondi's subbing layer, given the completely different purposes they serve in their respective inventions.

In addition, Totani does not disclose the pigment particle limitations of claim 1 for the undercoat layer (see paragraph [0059] of Totani, where the primary particle size is 0.2 to 20.0 μm). Sismondi's working examples do not mention the particle size of the pigments.

With regard to Sismondi's ink-receiving layer, the Examiner apparently refers to the inorganic filler (column 7, line 11) as being the inorganic ultrafine particles. However, there appears to be no disclosure in Sismondi that these should be **ultrafine**.

With regard to the boric acid, the Examiner cites Sismondi as requiring a "hardener" (column 8, line 62), with the hardeners listed being aldehydes, ketones, and other organic compounds. The Examiner cites Tsuchiya (column 8, line 54) as disclosing that boric acid is a hardener, defined as a compound which crosslinks with a binder (in particular, polyvinyl alcohol) composing a void layer. However, it is not clear that the hardener in Sismondi serves the same purpose as the hardeners in Sismondi, and therefore, the fact that both are called "hardeners" does not provide a proper motivation for this substitution. Moreover, given the different chemical nature of these "hardeners," it does not appear that boric acid can be substituted for the organic "hardeners" in Sismondi with a reasonable expectation of success.

Moreover, with regard to claim 4, Sismondi mentions, as a pigment for the ink receiving layer, calcium carbonate, talc, clay kaolin, etc., and hence does not teach that the ink-receiving layer contains an alumina hydrate as the inorganic ultrafine particles.

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Claims 1-4, 6, 9-11 are therefore not obvious over Sismondi et al. (US 6,387,473 B1), Totani et al. (US 2001/0009712 A1), Tsuchiya et al. (US 6,495,242 B1) and Quintens et al. (US 2002/0094421 A1), taken separately or in combination.

Claims 1-3, 5 and 7-11 are rejected under 35 U.S.C. §103(a) as being unpatentable over Kiyama et al. (WO 02/34541 A1) in view of Totani et al. (US 2001/0009712 A1). Kiyama et al. (US 2003/0072925 A1) is used as an English translation. (Office action paragraph no. 22)

The rejection of claims 1-3, 5 and 7-11 is respectfully traversed, and reconsideration is requested.

The Examiner cites Kiyama for disclosing ink receptive layer A and ink receptive layer B, as well as a primer layer between ink receptive layer A and the support. The Examiner considers ink receptive layer A to correspond to the ink-receiving layer in claim 1, and the primer layer in Kiyama to correspond to the pigment layer in claim 1.

The Examiner states that Kiyama's primer layer does not meet the limitations of the pigment layer in claim 1, but states that "it would have been obvious ... to combine the undercoat layer of Totani with the invention of Kiyama, and the motivation would be, as Totani suggests, controlling the water resistance property of the recording sheet."

In traversing the rejection, Applicant first of all notes, as with the previous rejections, that it is not clear how Totani's undercoat layer is being combined with Kiyama. Presumably, the Examiner is substituting Totani's undercoat layer for Kiyama's primer layer.

Kiyama's primer layer is disclosed in paragraph [0066], and is stated to be used when a water resistance support is used. The primer layer is stated to be composed of a natural polymer compound or synthetic resin, and to improve transparency of the ink-receptive layer. There is **no** disclosure that the primer layer would contain pigment. In Kiyama, it is not clear which component corresponds to the pigment. The closest component would appear to be the inorganic or organic fine particles of size 3 to 10 μm in ink-receptive layer B (paragraph [0040]). Clearly, there is no suggestion for pigment particles in Kiyama's primer layer.

Therefore, Kiyama's primer layer serves a completely different purpose than Totani's undercoat layer. There is no motivation for the substitution of Totani's undercoat layer for Kiyama's primer layer.

Moreover, Kiyama, paragraph [0066], states that a primer layer mainly comprising a natural polymer compound or synthetic resin is preferably provided on a water-resistant support such as a film or a resin-coated paper. In the working examples of Kiyama, a resin-coated paper is used, and gelatin is coated thereon to form a primer layer. Therefore, the results discussed above associated with the present invention, in which a paper support is used, are unexpected over Kiyama, as well.

Therefore, claims 1-3, 5 and 7-11 are not obvious over Kiyama et al. (WO 02/34541 A1) and Totani et al. (US 2001/0009712 A1), taken separately or in combination.


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If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact the applicants' undersigned agent at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

In the event that this paper is not timely filed, the applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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Enclosure: Petition for Extension of Time

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